

Appl. No. 10/646,708  
Amdt. Dated 02/13/2007  
Amendment to Office Action of 11/13/2006

**Amendments to the Drawing:**

Applicants have proposed amendments to drawing Figure 1 as required by the Examiner. In amended Figure 1, the handwritten reference symbols have been replaced with typed symbols. A Replacement Sheet for Figure 1 is attached to this Amendment.

### **REMARKS**

In the Office Action, the Examiner has rejected independent claims 1 and 12 under 35 U.S.C. § 103(a) as being unpatentable over U.S. Patent No. 5,525,796 to Haake in view of U.S. Patent No. 5,945,665 to Hay. As will be further discussed below, Applicants respectfully traverse the Examiner's rejections for at least the reason that Haake does not disclose the claimed feature of Applicants' invention in independent claims 1 and 12 where the recess in the workpiece has a breadth and depth matched to a diameter of the optical fiber and where the optical fiber is arranged in the recess.

In Applicants' invention, as claimed, the recess in the surface of the workpiece has a breadth and depth matched to a diameter of the optical fiber arranged in the recess. Applicants claim this feature because the Bragg grating optical fiber sensor that is arranged in the recess is used for the claimed measuring arrangement for testing workpieces (claim 1) and the claimed method for metrological instrumentation of workpieces (claim 12). Thus, as claimed and as disclosed in Applicants' specification at least at page 5, lines 5-8, the breadth and depth of the recess is matched to the diameter of the Bragg grating optical fiber sensor. Applicants respectfully submit that even if Haake discloses a groove 40 as a recess in a workpiece, that the groove does not have a breadth and depth matched to a diameter of the optical fiber 16.

In Haake, as can be clearly seen in Figure 5 and as disclosed at col. 8, lines 57-63, the breadth and depth of the groove 40 must be formed larger than the diameter of the fiber 16 because molten metallic material 18 must also be applied in the groove. The molten metallic material 18 is used to affix the fiber 16 in the groove 40. With the structure of Haake, a fracture in the metallic workpiece will also fracture the metallic material 18 and damage the fiber 16 such that the fracture can be detected.

Thus, Applicants respectfully submit that Haake does not disclose Applicants' claimed invention where the recess in the workpiece has a breadth and depth matched to a diameter of the optical fiber and where the optical fiber

is arranged in the recess. In Haake, the distance between the fiber and the groove is considerable in breadth and depth. This is so because in Haake, the molten metallic material 18 is filled in the groove and the fiber is disposed in the molten metallic material. In Applicants' invention, the recess has a breadth and depth matched to a diameter of the optical fiber because no molten metallic material is used with the Bragg grating sensor. Therefore, for at least this reason, Applicants respectfully submit that claims 1 and 12 are allowable over Haake and Hay. Hay does not cure the deficiencies in Haake discussed above.

Applicants also respectfully traverse the Examiner's argument that it would have been obvious to include the Bragg grating sensor of Hay in Haake. Applicants respectfully submit that there would be no motivation to include such a sensor in Haake.

In Applicants' invention, a Bragg grating sensor is used because, as discussed above, the invention is used for the claimed measuring arrangement for testing workpieces (claim 1) and the claimed method for metrological instrumentation of workpieces (claim 12). For this claimed testing and metrological instrumentation, the Bragg grating sensor is positioned within a recess that has a breadth and depth matched to a diameter of the fiber. No molten metallic material is used.

Applicants respectfully submit that there would be no motivation to include the Bragg grating sensor of Hay in Haake. There would be no need to. In Haake, as taught, a fracture in the workpiece results in damage to the fiber 16. "[T]he resulting damage to the fiber optic element 16 itself will attenuate the transmitted light such that the fracture in the workpiece may be detected." Col. 6, lines 4-8. Thus, all that is required in Haake is that a fiber be damaged as a result of a fracture of the workpiece so that the fracture can be detected. Applicants respectfully submit there would be no motivation to include a Bragg grating sensor in Haake for this purpose.

Further, even if a Bragg grating sensor could be included in Haake, Applicants respectfully submit that such a sensor could not serve the purpose

argued by the Examiner in the Office Action. The Examiner argues that including such a sensor "would allow for improved sensitivity of transmission of force fluctuations to the sensors." First, Applicants respectfully submit that the optical fiber in Haake does not have a purpose of detecting transmission of force fluctuations. It is used to detect a fracture in the workpiece. Thus, there is no need for "improved sensitivity of transmission of force fluctuations" in Haake.

Further, Applicants respectfully submit that including the Bragg grating sensor of Hay in Haake could not serve the purpose argued by the Examiner. In Haake, the Bragg grating sensor would be included in the molten metallic material. As disclosed in Haake, this material "has a relatively large coefficient of thermal expansion such that the metallic material 18 in the underlying workpiece will expand and contract similarly during temperature fluctuations..." Col. 7, lines 13-16. Thus, Applicants respectfully submit that including a Bragg grating sensor of Hay in molten metallic material of Haake that expands and contracts along with the workpiece could not have the purpose argued by the Examiner of improved sensitivity of transmission of force fluctuations. Again, in Haake, the optical fiber does not have such a purpose. It merely is used to detect a fracture of the workpiece by becoming damaged itself as a result of the fracture.

Therefore, Applicants respectfully submit that independent claims 1 and 12 are allowable for at least this additional reason over Haake and Hay.

In this Amendment, Applicants have provided a Replacement Sheet for Figure 1 for the Examiner's consideration. Applicants respectfully submit that the Replacement Sheet overcomes the Examiner's objection to the drawing.

Applicants respectfully submit that the application is now in condition for allowance with claims 1, 5-12, 15, 17, and 19-20 being allowable.

If there are any questions regarding this Amendment or the application in general, a telephone call to the undersigned would be appreciated since this should expedite the prosecution of the application for all concerned. Please

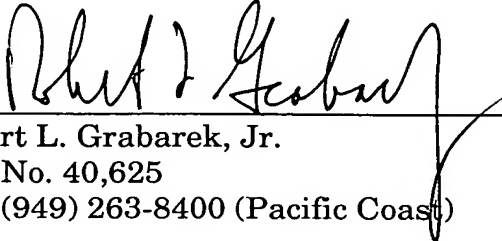
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charge any deficiency in fees or credit any overpayments to Deposit Account No.  
05-1323 (Docket No. 011235.52686US).

Respectfully submitted,

CROWELL & MORING LLP

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